

SUPPORT FOR THE AMENDMENTS

Support for the amendment to claim 1 is found in claim 6 as originally presented.

Support for the amendment to claim 7 is found in claim 10 as originally presented. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment claims 1-5, 7-9 and 11-13 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a water-based ink.

Applicants wish to thank Examiner Shosho for the helpful and courteous discussion held with their U.S. representative on June 16, 2005. At that time, Applicants' representative argued that none of the cited references disclosed or suggested particles of water-insoluble polymer containing a colorant. The following is intended to expand upon the discussion with the Examiner.

Water-based inks have gained increased popularity in recent times, especially for use in ink-jet printing. Performance properties as to water resistance, light fastness, rubbing density and optical density while maintaining good jetting properties remain desirable properties.

The claimed invention addresses this problem by providing a water-based ink based on a water-insoluble polymer having at least two hydroxyl groups at its end or having an ionic group at its end. Applicants have discovered that particles of such polymers containing a colorant provide for water-based inks of desirable performance. Such water-based inks are nowhere disclosed or suggested in the cited prior art of record.

Claims 1-6

This embodiment of the claimed invention is directed to a water-based ink comprising a colorant and a water-insoluble polymer having at least two hydroxyl groups at its end, where the colorant is contained in particles of the water-insoluble polymer.

Applicants wish to thank Examiner Shosho for indicating that claim 6 is allowable. Applicants have now rewritten claim 1 in independent form including all of the limitations of claim 6. The Examiner is respectfully requested to pass claims 1-5, and claims 11 and 12 to the extent that they depend from claims 1-5, to issue.

Claims 7-10

This embodiment of the claimed invention is directed to a water-based ink comprising a water-insoluble polymer having an ionic group at its end and a pigment, wherein the pigment is contained in the water-insoluble polymer.

The rejections of claims 7-13 as anticipated in various combinations over Cottrell et al., U.S. 2003/0176533, over Ma et al., U.S. 5,272,201, over Wang et al., U.S. 2002/0092797 and EP 1158030 and as obvious over EP1158030 in view of Hicks, U.S. 3,960,824 are respectfully traversed.

None of the cited prior art of record discloses or suggests an ink in which the pigment is **contained in the water-insoluble polymer** having an ionic group at its end.

Cottrell et al. does not describe particles of pigment-containing water-insoluble polymer having an ionic group at its end.

Cottrell et al. describes an ink or ink-jet printers based on a water-dissipatable polyester comprising polyethylene oxide segments paragraph [0007]. The ink composition is a liquid in which there are no particles of pigmented water-insoluble polymer as the composition is filtered such that the ink would not contain particles which would block an

ink-jet printer. As such, the reference fails to describe an ink composition based on the dispersion of particles of pigmented-containing water-insoluble polymer.

Ma et al. describes an aqueous ink-jet ink (column 2, lines 28-42) comprising an AB block polymer comprising a hydrophobic block and a hydrophilic block. This polymer is used as a dispersion stabilizer (column 4, lines 8-16) and not as a matrix for the pigment. As such, the reference fails to disclose or suggest an ink having particles of **pigment-containing water-insoluble polymer** having an ionic group at its end.

Wang et al. like Ma et al. describes a polymeric dispersant in which there may be hydrophilic end groups on the polymer. The polymer is described at paragraph [0053] as either water soluble or dispersible and described at paragraph [0057] as used as a dispersant to disperse the pigment particles used in the ink-jet ink. As such, the reference fails to disclose or suggest an ink comprising particles of **pigment-containing water-insoluble polymer** having an ionic group at its end.

In contrast the claimed invention is directed to a water-based ink comprising a water-insoluble polymer having an ionic group at its end and a pigment, wherein the water-based ink comprises an aqueous **dispersion of particles of pigment-containing water-insoluble polymer** having an ionic group at its end. Applicants note that claim 7 has been amended to recite that the water-based ink comprises an aqueous dispersion of particles of pigment-containing water-insoluble polymer.

As none of the cited references above describe an ink comprising a pigment-containing water-insoluble polymer having an ionic group at its end, the claimed invention is clearly neither anticipated nor made obvious by these references and withdrawal of the rejections based on obviousness is respectfully requested.

EP 1,158,030 does not describe a polymer having an ionic end group. The reference describes polymerization of the polymer using a train transfer agent such as octyl mercaptan,

n-dodecyl mercaptan, t-dodecyl mercaptan, n-tetradecyl mercaptan and mercaptoethanol ([0074]). None of these initiators result in a polymer having an ionic group at its end.

Applicants note that page 11 of the specification describes an ionic group as both “already having an electric charge and being in an ionic state”, and “not having an electric charge but being capable of forming an ion by external action”. Page 11 further describes ionic groups as including cationic, anionic and betaine groups. Exemplary cationic groups are described on page 12 as amine bases. Exemplary anionic groups are described on page 12 as including carboxylic, sulfonic and phosphoric acids and their salts. Exemplary betaine-based groups are described on page 12 as including carbobetaine, sulfobetaine and phosphobetaine groups. Mercaptoethanol is not described as forming a polymer having an ionic group at its end. Since the reference fails to describe a water-insoluble polymer having an ionic group at its end, the claimed invention is clearly neither anticipated nor made obvious by this reference and accordingly withdrawal of the rejections based on anticipation and obviousness is respectfully requested.

Furthermore, applicants observe an improved performance over polymer initiated with mercapto ethanol.

Prep. Ex. no. 4 appearing on page 30 in Table 1 of the specification describes a polymer in which the initiator is mercaptoethanol. Prep examples 11 and 12 were prepared from the polymer of prep example 4. The performance of these polymers is reported on page 38, table 3 in which comparative examples 1 and 2 using polymers initiated with mercaptoethanol displayed inferior jetting properties, water resistance, light fastness and rubbing resistance. As such, not only is the polymer of EP ‘030 not a polymer having an ionic group at its end as claimed but Applicants observe improved ink-jet performance by having an ionic group at its end. As such, the subject matter of claims 7-12 is neither

anticipated nor made obvious from these references and accordingly withdrawal of the rejections under 35 U.S.C. §102(e), §102(b) and §103(a) are respectfully requested.

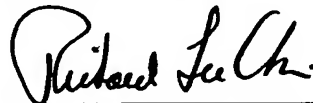
The rejection of claims 9 and 13 under 35 U.S.C. §112, second paragraph, has been obviated by appropriate amendment.

Applicants have now amended claims 9 and 13 as suggested by the Examiner. In view of Applicants' amendment, withdrawal of this ground of rejection is respectfully requested.

Applicants submit this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Richard L. Chinn, Ph.D.
Attorney of Record
Registration No. 34,305

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)
RLC/rac